



## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification <sup>6</sup> : <b>G01N 33/53</b>		A2	(11) International Publication Number: <b>WO 99/61909</b> (43) International Publication Date: 2 December 1999 (02.12.99)
(21) International Application Number: PCT/US99/11407 (22) International Filing Date: 26 May 1999 (26.05.99)		(81) Designated States: AU, CA, JP, US, European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE).  <b>Published</b> <i>Without international search report and to be republished upon receipt of that report.</i>	
(30) Priority Data: 60/086,695 26 May 1998 (26.05.98) US			
(71) Applicant (for all designated States except US): THE GOVERNMENT OF THE UNITED STATES OF AMERICA, as represented by THE SECRETARY, DEPARTMENT OF HEALTH AND HUMAN SERVICES [US/US]; Centers for Disease Control and Prevention, Technology Transfer Office, Executive Park, Building 4, Suite 1103, Atlanta, GA 30329 (US).			
(72) Inventor; and (75) Inventor/Applicant (for US only): PAU, Chou-Pong [US/US]; 1142 Vistavia Circle, Decatur, GA 30033 (US).			
(74) Agents: KULKARNI, Sima, Singadia et al.; Jones & Askew, LLP, 2400 Monarch Tower, 3424 Peachtree Road, N.E., Atlanta, GA 30326 (US).			
(54) Title: METHODS AND COMPOSITIONS FOR THE DETECTION OF HUMAN HERPESVIRUS			
(57) Abstract  Compositions and methods for the detection and diagnosis of infectious diseases are provided. In particular, efficient and sensitive compositions and methods for the detection of human herpesvirus 8 are provided. The claimed diagnostic compositions and methods involve the use of peptides representative of dominant antigenic regions of human herpesvirus in detection assays. Such assays are highly specific, sensitive and accurate.			

**Claims**

1. A method of detecting the presence human herpesvirus 8 in a biological sample, said method comprising:

5 (a) contacting one or more isolated, immunogenic human herpesvirus 8 peptides with an antibody-containing biological sample, and

10 (b) detecting the formation of a complex between the immunogenic peptide and the antibody wherein the presence of a peptide-antibody complex indicates the presence of human herpesvirus 8.

15 2. The method of Claim 1, wherein the immunogenic peptide comprises an amino acid sequence selected from the group consisting of SEQ ID NOS: 1-53, and conservative variations thereof.

20 3. The method of Claim 2, wherein the immunogenic peptide comprises an amino acid sequence selected from the group consisting of SEQ ID NOS: 5, 6, 19, 22, 23, 24 and 25 and conservative variations thereof.

25 4. The method of Claim 1, wherein the peptide is bound to a solid phase.

5. The method of Claim 1, wherein the peptide is labeled.

30 6. The method of Claim 5, wherein the label is selected from the group consisting of an electrochemiluminescent label, a chemiluminescent label, an enzymatic label, a bioluminescent label, and a fluorescent label.

-46-

7. The method of Claim 1, further comprising incubating the peptide-antibody complex with a second antibody specific for the peptide, wherein the second antibody is labeled with a detectable label and binds to the peptide-antibody complex.

5

8. The method of Claim 7, wherein the label is selected from the group consisting of an electrochemiluminescent label, a chemiluminescent label, an enzymatic label, a bioluminescent label, and a fluorescent label.

10

9. The method of Claim 1, wherein the biological sample comprises wounds, blood, tissues, saliva, semen, tears, urine, bone, muscle, cartilage, or skin.

15

10. An immunogenic composition comprising a pharmaceutically acceptable carrier and an isolated, immunogenic human herpesvirus 8 peptide in an amount sufficient to induce a protective immune response to human herpesvirus 8 in a mammal, said immunogenic peptide comprising an amino acid sequence selected from the group consisting of SEQ ID NOS: 1-53, and conservative variations thereof.

20

11. The composition of Claim 10, wherein the immunogenic peptide comprises an amino acid sequence selected from the group consisting of SEQ ID NOS: 5, 6, 19, 22, 23, 24 and 25 and conservative variations thereof.

25

12. The composition of Claim 10, wherein the immunogenic peptide is conjugated to a carrier protein.

30

13. An isolated, immunogenic human herpesvirus 8 peptide, said immunogenic peptide comprising an amino acid sequence selected from the group consisting of SEQ ID NOS: 1-53, and conservative variations thereof.

35

5

14. The immunogenic peptide in accordance with claim 11, wherein said immunogenic peptide binds to an antibody specifically immunoreactive with a peptide selected from the group consisting of SEQ ID NOS: 1-53, and conservative variations thereof.

10

15. The immunogenic peptide in accordance with claim 11, wherein said immunogenic peptide is used to detect the presence of human herpesvirus 8 antibodies in a biological sample comprising wounds, blood, tissues, saliva, semen, tears, urine, bone, muscle, cartilage, or skin.

15

16. An isolated antibody capable of binding to a human herpesvirus 8 immunogenic peptide.

17. The isolated antibody of Claim 16, wherein the immunogenic peptide comprises an amino acid sequence selected from the group consisting of SEQ ID NOS: 1-53, and conservative variations thereof.

20

18. The isolated antibody of Claim 16, wherein the immunogenic peptide comprises an amino acid sequence selected from the group consisting of SEQ ID NOS: 5, 6, 19, 22, 23, 24 and 25 and conservative variations thereof.

25

19. The isolated antibody of Claim 16, wherein the antibody is isolated from a biological sample comprising wounds, blood, tissues, saliva, semen, tears, urine, bone, muscle, cartilage, or skin.

30

20. The isolated antibody of Claim 16, wherein the antibody is a monoclonal antibody.

35

-1-

## SEQUENCE LISTING

<110> The Government of the United States of America  
 <120> Methods and Compositions for the Detection of Human  
 Herpesvirus  
 <130> 03063-0471WP  
 <140> 1  
 <141> 1999-05-26  
 <150> 60/086,695  
 <151> 1998-05-26  
 <160> 53  
 <170> PatentIn Ver. 2.0  
 <210> 1  
 <211> 170  
 <212> PRT  
 <213> Human Herpesvirus Type 8  
 <400> 1

Met Ser Asn Phe Lys Val Arg Asp Pro Val Ile Gln Glu Arg Leu Asp  
 1 5 10 15  
 His Asp Tyr Ala His His Pro Leu Val Ala Arg Met Asn Thr Leu Asp  
 20 25 30  
 Gln Gly Asn Met Ser Gln Ala Glu Tyr Leu Val Gln Lys Arg His Tyr  
 35 40 45  
 Leu Val Phe Leu Ile Ala His His Tyr Tyr Glu Ala Tyr Leu Arg Arg  
 50 55 60  
 Met Gly Gly Ile Gln Arg Arg Asp His Leu Gln Thr Leu Arg Asp Gln  
 65 70 75 80  
 Lys Pro Arg Glu Arg Ala Asp Arg Val Ser Ala Ala Ser Ala Tyr Asp  
 85 90 95  
 Ala Gly Thr Phe Thr Val Pro Ser Arg Pro Gly Pro Ala Ser Gly Thr  
 100 105 110  
 Thr Pro Gly Gly Gln Asp Ser Leu Gly Val Ser Gly Ser Ser Ile Thr  
 115 120 125  
 Thr Leu Ser Ser Gly Pro His Ser Leu Ser Pro Ala Ser Asp Ile Leu  
 130 135 140  
 Thr Thr Leu Ser Ser Thr Thr Glu Thr Ala Ala Pro Ala Val Ala Asp  
 145 150 155 160  
 Ala Arg Lys Pro Pro Ser Gly Lys Lys Lys  
 165 170

<210> 2  
 <211> 197  
 <212> PRT  
 <213> Human Herpesvirus Type 8  
 <400> 2

Met Ser Ser Thr Gln Ile Arg Thr Glu Ile Pro Val Ala Leu Leu Ile  
 1 5 10 15  
 Leu Cys Leu Cys Leu Val Ala Cys His Ala Asn Cys Pro Thr Tyr Arg  
 20 25 30  
 Ser His Leu Gly Phe Trp Gln Glu Gly Trp Ser Gly Gln Val Tyr Gln  
 35 40 45  
 Asp Trp Leu Gly Arg Met Asn Cys Ser Tyr Glu Asn Met Thr Ala Leu  
 50 55 60

-2-

Glu Ala Val Ser Leu Asn Gly Thr Arg Leu Ala Ala Gly Ser Pro Ser  
 65 70 75 86  
 Ser Glu Tyr Pro Asn Val Ser Val Ser Val Glu Asp Thr Ser Ala Ser  
 85 90 95  
 Gly Ser Gly Glu Asp Ala Ile Asp Glu Ser Gly Ser Gly Glu Glu Glu  
 100 105 110  
 Arg Pro Val Thr Ser His Val Thr Phe Met Thr Gln Ser Val Gln Ala  
 115 120 125  
 Thr Thr Glu Leu Thr Asp Ala Leu Ile Ser Ala Phe Ser Gly Val Leu  
 130 135 140  
 His Val Ser Thr Val Ile Pro Arg Asn Trp Val Asn Arg Arg Cys Val  
 145 150 155 160  
 Gly Ile Lys Arg Asn Leu Thr Phe Cys Leu Ile Tyr Arg Ile Ile Phe  
 165 170 175  
 Ile Trp Gly Thr Ile Gln Asp His Ala Asn Ser Arg Ile Thr Gly Arg  
 180 185 190  
 Arg Lys Arg Gln Lys  
 195

&lt;210&gt; 3

&lt;211&gt; 34

&lt;212&gt; PRT

&lt;213&gt; Human Herpesvirus Type 8

&lt;400&gt; 3

Ala Ala Ser Ala Tyr Asp Ala Gly Thr Phe Thr Val Pro Ser Arg Pro  
 1 5 10 15  
 Gly Pro Ala Ser Gly Thr Thr Pro Gly Gly Gln Asp Ser Leu Gly Val  
 20 25 30  
 Ser Gly

&lt;210&gt; 4

&lt;211&gt; 31

&lt;212&gt; PRT

&lt;213&gt; Human Herpesvirus Type 8

&lt;400&gt; 4

Gln Asp Ser Leu Gly Val Ser Gly Ser Ser Ile Thr Thr Leu Ser Ser  
 1 5 10 15  
 Gly Pro His Ser Leu Ser Pro Ala Ser Asp Ile Leu Thr Thr Leu  
 20 25 30

&lt;210&gt; 5

&lt;211&gt; 31

&lt;212&gt; PRT

&lt;213&gt; Human Herpesvirus Type 8

&lt;400&gt; 5

Ala Ser Asp Ile Leu Thr Thr Leu Ser Ser Thr Thr Glu Thr Ala Ala  
 1 5 10 15  
 Pro Ala Val Ala Asp Ala Arg Lys Pro Pro Ser Gly Lys Lys Lys  
 20 25 30

<210> 6  
<211> 14  
<212> PRT  
<213> Human Herpesvirus Type 8  
<400> 6  
Ala Val Ala Asp Ala Arg Lys Pro Pro Ser Gly Lys Lys Lys  
1 5 10

<210> 7  
<211> 14  
<212> PRT  
<213> Human Herpesvirus Type 8  
<400> 7  
Ala Val Ala Gly Ala Arg Lys Pro Pro Ser Gly Lys Lys Lys  
1 5 10

<210> 8  
<211> 14  
<212> PRT  
<213> Human Herpesvirus Type 8  
<400> 8  
Ala Val Ala Asp Leu Arg Lys Pro Pro Ser Gly Lys Lys Lys  
1 5 10

<210> 9  
<211> 14  
<212> PRT  
<213> Human Herpesvirus Type 8  
<400> 9  
Ala Val Ala Asp Ala Gly Lys Pro Pro Ser Gly Lys Lys Lys  
1 5 10

<210> 10  
<211> 14  
<212> PRT  
<213> Human Herpesvirus Type 8  
<400> 10  
Ala Val Ala Asp Ala Arg Gly Pro Pro Ser Gly Lys Lys Lys  
1 5 10

<210> 11  
<211> 14  
<212> PRT  
<213> Human Herpesvirus Type 8  
<400> 11  
Ala Val Ala Asp Ala Arg Lys Gly Pro Ser Gly Lys Lys Lys  
1 5 10

<210> 12  
<211> 14  
<212> PRT  
<213> Human Herpesvirus Type 8  
<400> 12  
Ala Val Ala Asp Ala Arg Lys Pro Gly Ser Gly Lys Lys  
1 5 10

<210> 13  
<211> 14  
<212> PRT  
<213> Human Herpesvirus Type 8  
<400> 13  
Ala Val Ala Asp Ala Arg Lys Pro Pro Gly Gly Lys Lys  
1 5 10

<210> 14  
<211> 14  
<212> PRT  
<213> Human Herpesvirus Type 8  
<400> 14  
Ala Val Ala Asp Ala Arg Lys Pro Pro Ser Leu Lys Lys  
1 5 10

<210> 15  
<211> 14  
<212> PRT  
<213> Human Herpesvirus Type 8  
<400> 15  
Ala Val Ala Asp Ala Arg Lys Pro Pro Ser Gly Gly Lys Lys  
1 5 10

<210> 16  
<211> 14  
<212> PRT  
<213> Human Herpesvirus Type 8  
<400> 16  
Ala Val Ala Asp Ala Arg Lys Pro Pro Ser Gly Lys Gly Lys  
1 5 10

<210> 17  
<211> 14  
<212> PRT  
<213> Human Herpesvirus Type 8  
<400> 17  
Ala Val Ala Asp Ala Arg Lys Pro Pro Ser Gly Lys Lys Gly  
1 5 10

<210> 18  
<211> 8

-5-

&lt;212&gt; PRT

&lt;213&gt; Human Herpesvirus Type 8

&lt;400&gt; 18

Arg Lys Pro Pro Ser Gly Lys Lys  
1 5

&lt;210&gt; 19

&lt;211&gt; 31

&lt;212&gt; PRT

&lt;213&gt; Human Herpesvirus Type 8

&lt;400&gt; 19

Arg Ser His Leu Gly Phe Trp Gln Glu Gly Trp Ser Gly Gln Val Tyr  
1 5 10 15  
Gln Asp Trp Leu Gly Arg Met Asn Cys Ser Tyr Glu Asn Met Thr  
20 25 30

&lt;210&gt; 20

&lt;211&gt; 60

&lt;212&gt; PRT

&lt;213&gt; Human Herpesvirus Type 8

&lt;400&gt; 20

Met Asp Arg Gly Leu Thr Val Phe Val Ala Val His Val Pro Asp Val  
1 5 10 15  
Leu Leu Asn Gly Trp Arg Trp Arg Leu Gly Ala Ile Pro Pro Leu Val  
20 25 30  
Cys Leu Leu Ala Ile Ser Val Val Pro Pro Ser Gly Gln Arg Gly Pro  
35 40 45  
Val Ala Phe Arg Thr Arg Val Ala Thr Gly Ala His  
50 55 60

&lt;210&gt; 21

&lt;211&gt; 1162

&lt;212&gt; PRT

&lt;213&gt; Human Herpesvirus Type 8

&lt;400&gt; 21

Met Ala Pro Pro Gly Met Arg Leu Arg Ser Gly Arg Ser Thr Gly Ala  
1 5 10 15  
Pro Leu Thr Arg Gly Ser Cys Arg Lys Arg Asn Arg Ser Pro Glu Arg  
20 25 30  
Cys Asp Leu Gly Asp Asp Leu His Leu Gln Pro Arg Arg Lys His Val  
35 40 45  
Ala Asp Ser Ile Asp Gly Arg Glu Cys Gly Pro His Thr Leu Pro Ile  
50 55 60  
Pro Gly Ser Pro Thr Val Phe Thr Ser Gly Leu Pro Ala Phe Val Ser  
65 70 75 80

-6-

Ser Pro Thr Leu Pro Val Ala Pro Ile Pro Ser Pro Ala Pro Ala **F13**  
 85 90 95  
 Pro Leu Pro Pro Pro Ala Leu Leu Pro Pro Val Thr Thr Ser Ser Ser  
 100 105 110  
 Pro Ile Pro Pro Ser His Pro Val Ser Pro Gly Thr Thr Asp Thr His  
 115 120 125  
 Ser Pro Ser Pro Ala Leu Pro Pro Thr Gln Ser Pro Glu Ser Ser Gln  
 130 135 140  
 Arg Pro Pro Leu Ser Ser Pro Thr Gly Arg Pro Asp Ser Ser Thr Pro  
 145 150 155 160  
 Met Arg Pro Pro Pro Ser Gln Gln Thr Thr Pro Pro His Ser Pro Thr  
 165 170 175  
 Thr Pro Pro Pro Glu Pro Pro Ser Lys Ser Ser Pro Asp Ser Leu Ala  
 180 185 190  
 Pro Ser Thr Leu Arg Ser Leu Arg Lys Arg Arg Leu Ser Ser Pro Gln  
 195 200 205  
 Gly Pro Ser Thr Leu Asn Pro Ile Cys Gln Ser Pro Pro Val Ser Pro  
 210 215 220  
 Pro Arg Cys Asp Phe Ala Asn Arg Ser Val Tyr Pro Pro Trp Ala Thr  
 225 230 235 240  
 Glu Ser Pro Ile Tyr Val Gly Ser Ser Ser Asp Gly Asp Thr Pro Pro  
 245 250 255  
 Arg Gln Pro Pro Thr Ser Pro Ile Ser Ile Gly Ser Ser Ser Pro Ser  
 260 265 270  
 Glu Gly Ser Trp Gly Asp Asp Thr Ala Met Leu Val Leu Leu Ala Glu  
 275 280 285  
 Ile Ala Glu Glu Ala Ser Lys Asn Glu Lys Glu Cys Ser Glu Asn Asn  
 290 295 300  
 Gln Ala Gly Glu Asp Asn Gly Asp Asn Glu Ile Ser Lys Glu Ser Gln  
 305 310 315 320  
 Val Asp Lys Asp Asp Asn Asp Lys Asp Asp Glu Glu Gln Glu  
 325 330 335  
 Thr Asp Glu Glu Asp Glu Glu Asp Asp Glu Glu Asp Asp Glu Glu Asp  
 340 345 350  
 Asp Glu Glu Asp Asp Glu Glu Asp Asp Glu Glu Asp Asp Glu Glu Asp  
 355 360 365  
 Asp Glu Glu Asp Asp Glu Glu Asp Asp Glu Glu Asp Asp Glu Glu Asp  
 370 375 380  
 Asp Glu Glu Glu  
 385 390 395 400  
 Glu Asp Glu Glu Asp Asp Asp Glu Asp Asn Glu Asp Glu Glu Asp  
 405 410 415  
 Asp Glu Glu Asp Lys Lys Glu Asp Glu Glu Asp Gly Gly Asp Gly  
 420 425 430  
 Asn Lys Thr Leu Ser Ile Gln Ser Ser Gln Gln Gln Glu Pro Gln  
 435 440 445  
 Gln Gln Glu Pro Gln Gln Gln Glu Pro Gln Gln Gln Glu Pro Leu Gln  
 450 455 460  
 Glu Pro Gln Gln Gln Glu Pro Gln Gln Gln Glu Pro Gln Gln Gln  
 465 470 475 480  
 Pro Leu Gln Glu Pro Gln Gln Gln Glu Pro Gln Gln Gln Glu Pro Leu  
 485 490 495  
 Gln Glu Pro Gln Gln Gln Glu Pro Gln Gln Gln Glu Pro Gln Gln Gln  
 500 505 510  
 Glu Pro Gln Gln Gln Glu Pro Gln Gln Gln Glu Pro Gln Gln Gln  
 515 520 525  
 Pro Gln Gln Gln Glu Pro Gln Gln Gln Glu Pro Gln Gln Gln Glu Pro  
 530 535 540  
 Gln Gln Gln Glu Pro Gln Gln Arg Glu Pro Gln Gln Arg Glu Pro Gln  
 545 550 555 560

Gln Arg Glu Pro Gln Cys Arg Glu Pro Gln Gln Arg Glu Pro Gl 3ln  
 565 570 575  
 Arg Glu Pro Gln Gln Arg Glu Pro Gln Gln Arg Glu Pro Gln Gln Arg  
 580 585 590  
 Glu Pro Gln Gln Gln Asp Glu Gln Gln Asp Glu Gln Gln Gln Asp  
 595 600 605  
 Glu Gln Gln Gln Asp Glu Gln Gln Asp Glu Gln Gln Gln Asp Glu  
 610 615 620  
 Gln Gln Gln Asp Glu Gln Gln Asp Glu Gln Gln Asp Glu Gln  
 625 630 635 640  
 Gln Gln Asp Glu Gln Gln Asp Glu Gln Gln Asp Glu Gln Gln  
 645 650 655  
 Gln Asp Glu Gln Gln Asp Glu Gln Gln Asp Glu Gln Gln Gln  
 660 665 670  
 Asp Glu Gln Gln Gln Asp Glu Gln Gln Asp Glu Gln Gln Gln Asp  
 675 680 685  
 Glu Gln Gln Gln Asp Glu Gln Gln Asp Glu Gln Gln Gln Asp  
 690 695 700  
 Glu Gln Glu Gln Gln Asp Glu Gln Glu Gln Gln Asp Glu Gln Gln  
 705 710 715 720  
 Asp Glu Gln Gln Gln Asp Glu Gln Gln Gln Asp Glu Gln Gln  
 725 730 735  
 Gln Gln Asp Glu Gln Gln Gln Asp Glu Gln Gln Gln Asp Glu  
 740 745 750  
 Gln Glu Gln Gln Glu Glu Gln Gln Glu Glu Gln Glu Gln Glu  
 755 760 765  
 Leu Glu Glu Gln Glu Leu Glu Asp Gln Glu Gln Glu Leu Glu  
 770 775 780  
 Glu Gln Glu Gln Glu Leu Glu Glu Gln Glu Leu Glu Glu Gln  
 785 790 795 800  
 Glu Gln Glu Leu Glu Glu Gln Glu Leu Glu Glu Gln Glu Gln  
 805 810 815  
 Glu Leu Glu Glu Gln Glu Glu Leu Glu Glu Gln Glu Glu Leu  
 820 825 830  
 Glu Glu Gln Glu Gln Glu Leu Glu Glu Gln Glu Val Glu Gln Glu  
 835 840 845  
 Gln Glu Val Glu Glu Gln Glu Gln Glu Gln Glu Gln Glu Leu Glu  
 850 855 860  
 Glu Val Glu Glu Gln Glu Glu Gln Glu Glu Gln Glu Glu Gln Glu  
 865 870 875 880  
 Leu Glu Glu Val Glu Glu Gln Glu Glu Leu Glu Glu Val Glu  
 885 890 895  
 Glu Gln Glu Glu Gln Glu Leu Glu Glu Val Glu Gln Glu Gln Gln  
 900 905 910  
 Glu Leu Glu Glu Val Glu Glu Gln Gln Gln Gly Val Glu Gln Gln  
 915 920 925  
 Glu Gln Glu Thr Val Glu Glu Pro Ile Ile Leu His Gly Ser Ser Ser  
 930 935 940  
 Glu Asp Glu Met Glu Val Asp Tyr Pro Val Val Ser Thr His Glu Gln  
 945 950 955 960  
 Ile Ala Ser Ser Pro Pro Gly Asp Asn Thr Pro Asp Asp Asp Pro Gln  
 965 970 975  
 Pro Gly Pro Ser Arg Glu Tyr Arg Tyr Val Leu Arg Thr Ser Pro Pro  
 980 985 990  
 His Arg Pro Gly Val Arg Met Arg Arg Val Pro Val Thr His Pro Lys  
 995 1000 1005  
 Lys Pro His Pro Arg Tyr Gln Gln Pro Pro Val Pro Tyr Arg Gln Ile  
 1010 1015 1020  
 Asp Asp Cys Pro Ala Lys Ala Arg Pro Gln His Ile Phe Tyr Arg Arg  
 1025 1030 1035 1040

Phe Leu Gly Lys Asp Gly Arg Arg Asp Pro Lys Cys Gln Trp Lys Phe  
 1045 1050 1055  
 Ala Val Ile Phe Trp Gly Asn Asp Pro Tyr Gly Leu Lys Lys Leu Ser  
 1060 1065 1070  
 Gln Ala Phe Gln Phe Gly Gly Val Lys Ala Gly Pro Val Ser Cys Leu  
 1075 1080 1085  
 Pro His Pro Gly Pro Asp Gln Ser Pro Ile Thr Tyr Cys Val Tyr Val  
 1090 1095 1100  
 Tyr Cys Gln Asn Lys Asp Thr Ser Lys Lys Val Gln Met Ala Arg Leu  
 1105 1110 1115 1120  
 Ala Trp Glu Ala Ser His Pro Leu Ala Gly Asn Leu Gln Ser Ser Ile  
 1125 1130 1135  
 Val Lys Phe Lys Lys Pro Leu Pro Leu Thr Gln Pro Gly Glu Asn Gln  
 1140 1145 1150

Gly Pro Gly Asp Ser Pro Gln Glu Met Thr  
 1155 1160

<210> 22

<211> 228

<212> PRT

<213> Human Herpesvirus Type 8

<400> 22

Met Ser Ser Thr Gln Ile Arg Thr Glu Ile Pro Val Ala Leu Leu Ile  
 1 5 10 15  
 Leu Cys Leu Cys Leu Val Ala Cys His Ala Asn Cys Pro Thr Tyr Arg  
 20 25 30  
 Ser His Leu Gly Phe Trp Gln Glu Gly Trp Ser Gly Gln Val Tyr Gln  
 35 40 45  
 Asp Trp Leu Gly Arg Met Asn Cys Ser Tyr Glu Asn Met Thr Ala Leu  
 50 55 60  
 Glu Ala Val Ser Leu Asn Gly Thr Arg Leu Ala Ala Gly Ser Pro Ser  
 65 70 75 80  
 Ser Glu Tyr Pro Asn Val Ser Val Ser Val Glu Asp Thr Ser Ala Ser  
 85 90 95  
 Gly Ser Gly Glu Asp Ala Ile Asp Glu Ser Gly Ser Gly Glu Glu  
 100 105 110

Arg Pro Val Thr Ser His Val Thr Phe Met Thr Gln Ser Val Gln Ala  
 115 120 125  
 Thr Thr Glu Leu Thr Asp Ala Leu Ile Ser Ala Phe Ser Gly Ser Tyr  
 130 135 140  
 Ser Ser Gly Glu Pro Ser Arg Thr Thr Arg Ile Arg Val Ser Pro Val  
 145 150 155 160  
 Ala Glu Asn Gly Arg Asn Ser Gly Ala Ser Asn Arg Val Pro Phe Ser  
 165 170 175

Ala Thr Thr Thr Thr Arg Gly Arg Asp Ala His Tyr Asn Ala Glu  
 180 185 190  
 Ile Arg Thr His Leu Tyr Ile Leu Trp Ala Val Gly Leu Leu Leu Gly  
 195 200 205  
 Leu Val Leu Ile Leu Tyr Leu Cys Val Pro Arg Cys Arg Arg Lys Lys  
 210 215 220  
 Pro Tyr Ile Val  
 225

&lt;210&gt; 23

&lt;211&gt; 167

&lt;212&gt; PRT

&lt;213&gt; Human Herpesvirus Type 8

&lt;400&gt; 23

Met Ser Ser Thr Gln Ile Arg Thr Glu Ile Pro Val Ala Leu Leu Ile  
 1 5 10 15  
 Leu Cys Leu Cys Leu Val Ala Cys His Ala Asn Cys Pro Thr Tyr Arg  
 20 25 30  
 Ser His Leu Gly Phe Trp Gln Glu Gly Trp Ser Gly Gln Val Tyr Gln  
 35 40 45  
 Asp Trp Leu Gly Arg Met Asn Cys Tyr Ser Glu Asn Met Thr Ala Leu  
 50 55 60  
 Glu Ala Val Ser Leu Asn Gly Thr Arg Leu Ala Ala Gly Ser Pro Ser  
 65 70 75 80  
 Arg Ser Tyr Ser Ser Gly Glu Pro Ser Arg Thr Thr Arg Ile Arg Val  
 85 90 95  
 Ser Pro Val Ala Glu Asn Gly Arg Asn Ser Gly Ala Ser Asn Arg Val  
 100 105 110  
 Pro Phe Ser Ala Thr Thr Thr Arg Gly Arg Asp Ala His Tyr  
 115 120 125  
 Asn Ala Glu Ile Arg Thr His Leu Tyr Ile Leu Trp Ala Val Gly Leu  
 130 135 140  
 Leu Leu Gly Leu Val Leu Ile Leu Tyr Leu Cys Val Pro Arg Cys Arg  
 145 150 155 160  
 Arg Lys Lys Pro Tyr Ile Val  
 165

&lt;210&gt; 24

&lt;211&gt; 20

&lt;212&gt; PRT

&lt;213&gt; Human Herpesvirus Type 8

&lt;400&gt; 24

Gln Glu Gly Trp Ser Gly Gln Val Tyr Gln Asp Trp Leu Gly Arg Met  
 1 5 10 15  
 Asn Cys Ser Tyr  
 20

&lt;210&gt; 25

&lt;211&gt; 34

&lt;212&gt; PRT

&lt;213&gt; Human Herpesvirus Type 8

&lt;400&gt; 25

Ser His Leu Gly Phe Trp Gln Glu Gly Trp Ser Gly Gln Val Tyr Gln  
 1 5 10 15  
 Asp Trp Leu Gly Arg Met Asn Cys Tyr Ser Glu Ser Ser Thr Thr Glu  
 20 25 30  
 Thr Ala

&lt;210&gt; 26

<211> 20  
<212> PRT  
<213> Human Herpesvirus Type 8  
<400> 26  
His Ala Asn Cys Pr Thr Tyr Arg Ser His Leu Gly Phe Trp Gln Glu  
1 5 10 15  
Gly Trp Ser Gly  
20

<210> 27  
<211> 20  
<212> PRT  
<213> Human Herpesvirus Type 8  
<400> 27  
Met Asn Cys Ser Tyr Glu Asn Met Thr Ala Leu Glu Ala Val Ser Leu  
1 5 10 15  
Asn Gly Thr Arg  
20

<210> 28  
<211> 20  
<212> PRT  
<213> Human Herpesvirus Type 8  
<400> 28  
Leu Asn Gly Thr Arg Leu Ala Ala Gly Ser Pro Ser Ser Glu Tyr Pro  
1 5 10 15  
Asn Val Ser Val  
20

<210> 29  
<211> 22  
<212> PRT  
<213> Human Herpesvirus Type 8  
<400> 29  
Tyr Pro Asn Val Ser Val Ser Val Glu Asp Thr Ser Ala Ser Gly Ser  
1 5 10 15  
Gly Glu Asp Ala Ile Asp  
20

<210> 30  
<211> 22  
<212> PRT  
<213> Human Herpesvirus Type 8  
<400> 30  
Gly Glu Asp Ala Ile Asp Glu Ser Gly Ser Gly Glu Glu Glu Arg Pro  
1 5 10 15  
Val Thr Ser His Val Thr  
20

<210> 31  
<211> 20  
<212> PRT  
<213> Human Herpesvirus Type 8  
<400> 31  
Val Thr Ser His Val Thr Phe Met Thr Gln Ser Val Gln Ala Thr Thr  
1 5 10 15  
Glu Leu Thr Asp

-11-

20

&lt;210&gt; 32

&lt;211&gt; 20

&lt;212&gt; PRT

&lt;213&gt; Human Herpesvirus Type 8

&lt;400&gt; 32

Thr Thr Glu Ile Thr Asp Ala Leu Ile Ser Ala Phe Ser Gly Ser Tyr  
1 5 10 15  
Ser Ser Gly Glu

20

&lt;210&gt; 33

&lt;211&gt; 20

&lt;212&gt; PRT

&lt;213&gt; Human Herpesvirus Type 8

&lt;400&gt; 33

Gly Ser Tyr Ser Ser Gly Glu Pro Ser Arg Thr Thr Arg Ile Arg Val  
1 5 10 15  
Ser Pro Val Ala  
20

&lt;210&gt; 34

&lt;211&gt; 20

&lt;212&gt; PRT

&lt;213&gt; Human Herpesvirus Type 8

&lt;400&gt; 34

Arg Ile Arg Val Ser Pro Val Ala Glu Asn Gly Arg Asn Ser Gly Ala  
1 5 10 15  
Ser Asn Arg Val  
20

&lt;210&gt; 35

&lt;211&gt; 20

&lt;212&gt; PRT

&lt;213&gt; Human Herpesvirus Type 8

&lt;400&gt; 35

Asn Ser Gly Ala Ser Asn Arg Val Pro Phe Ser Ala Thr Thr Thr  
1 5 10 15  
Thr Arg Gly Arg  
20

&lt;210&gt; 36

&lt;211&gt; 20

&lt;212&gt; PRT

&lt;213&gt; Human Herpesvirus Type 8

&lt;400&gt; 36

Thr Thr Thr Thr Arg Gly Arg Asp Ala His Tyr Asn Ala Glu Ile  
1 5 10 15  
Arg Thr His Leu  
20

&lt;210&gt; 37

&lt;211&gt; 20

&lt;212&gt; PRT

&lt;213&gt; Human Herpesvirus Type 8

&lt;400&gt; 37

Gln Glu Val Trp Ser Gly Gln Val Tyr Gln Asp Trp Leu Gly Arg Met  
1 5 10 15